

Preliminary studies of serial microtome sections of flowers of other species of the Aurantioideae have shown that loose or attached accessory bundles or both occur in 16 species in both of the tribes 4 of the 6 subtribes, and 8 genera. These bundles show great diversity in structure, course, and branching from those described for *M. koenigii*. On the other hand, a very thorough study of several other species of the Aurantioideae has not disclosed a single accessory bundle.

SUMMARY

Although the vascular anatomy of the orange subfamily has been under study for over three-quarters of a century, Ford (3) was the first person to mention the presence of accessory bundles, which he described in the lemon. The present paper describes loose and attached accessory bundles which

occur in the receptacle and calyx of *Muraya koenigii* and discusses their histology and relation to the main vascular system. It is pointed out that accessory vascular bundles are of widespread occurrence in the flowers of many other members of the subfamily Aurantioideae.

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ENTOMOLOGY.—Concerning Neotropical Tingitidae (Hemiptera).¹ C. J. DRAKE and E. J. HAMBLETON.

The present paper contains notes on 57 species of Neotropical Tingitidae, including the descriptions of two new genera and 22 new species. The types are in the Drake collection. The collections were made by E. J. Hambleton.

Family PIESMIDAE

Piesma cinerea (Say)

Los Cerritos, Guatemala, 18 specimens, taken on *Amaranthus*, July 5, 1944. This species is widely distributed, ranging from Canada south into Argentina.

Family TINGITIDAE

Subfamily CANTACADERINAE

Phatnoma annulipes Champion

Turrialba, Costa Rica, 2 specimens, on *Vernonia* sp., August 13, 1944.

Subfamily TINGITINAE

Monanthia c-nigrum Champion

El Porvenir, Guatemala, 7 specimens, July 9, 1944.

Monanthia loricata Distant

Villavicencio, Colombia, 50 specimens, November 3, 1944.

Monanthia berryi Drake

Machala, Ecuador, 14 specimens, Sept. 27, 1944. Recorded in the literature from Peru.

Monanthia monotropidia Stål

Tingo María, Peru, 3 specimens, September 14, 1944. Villavicencio, Colombia, 5 specimens, November 3, 1944, and San Andrés, El Salvador, 1 specimen, July 21, 1944.

Monanthia senta Drake and Hambleton

Salinas, Ecuador, 12 specimens, October 14, 1944; Machala, Ecuador, 6 specimens, September 27, 1944.

Monanthia pucallpana, n. sp.

Head black, shining, with five rather short, forward-directed, testaceous spines; eyes black. Antennae moderately long, indistinctly pilose; segment I short, slightly thickened, reddish brown; II slightly slenderer, reddish; III very slender, testaceous, about two and one-half times as long as IV; IV clavate, hairy. Bucculae broad, reticulated, closed in front. Rostrum moderately long, yellowish brown, extending to middle coxae. Legs moderately long, ferruginous, the tibiae testaceous, the tarsi dark. Body beneath black.

¹ Received May 15, 1945.

Pronotum dark ferrugineous, moderately convex, coarsely pitted, tricarinate, lateral carinae short, present only on triangular process, slightly divaricating posteriorly; median carina more elevated, uniseriate, except posteriorly on triangular process; paranota moderately broad, completely reflexed, testaceous, not touching median carina, with three raised nervures; collar raised, reticulated, testaceous. Elytra ferrugineous, costal area mostly uniseriate, biseriate in widest part, testaceous, with some of the nervures infusate, the areolae large and hyaline; discoidal area moderately large, with the posterior part of nervure separating it from subcostal strongly curved so as to form a C-shaped expansion in subcostal area, there with an oblique, raised line closing opening.

Length, 3.85 mm; width, 1.25 mm.

Type (male), allotype (female), and 14 paratypes, Pucallpa, Peru, September 5, 1944. This species is most closely related to *M. c-nigrum* Champion and *M. loricata* Distant but is easily separated from them by the wider paranota (roughened with raised, longitudinal lines) and the much wider costal area (biseriate in widest part).

Teleonemia quechua Monte

Aguaytia, Peru, September 10, 1944, 10 examples. Numerous other specimens are also at hand from Satipo, Cafete, Tingo María, Callauga, and Vilcanota, Peru. The many specimens exhibit some variation in size and color, and the male tends to be a little smaller than the female.

Teleonemia lanceolata (Walker)

Tingo María, Peru, 1 male, September 10, 1944. *T. albomarginata* Champion is a synonym of this species. It is widely distributed in Central and South America.

Teleonemia scrupulosa Stål

Villavicencio, Colombia, 1 male, November 3, 1944. The lantana lace bug is common in tropical America.

Teleonemia prolixa Stål

Pichilingue, Ecuador, 1 example, October 1-2, 1944.

Nyctotingis osborni Drake

Tingo María, Peru, 2 examples, from bamboo, September 10, 1944. These specimens are

larger than the type and other specimens from Brazil, but there seems to be no structural differences.

Tingis abundans, n. sp.

Head brown, convex, with five testaceous spines; median spine moderately long, porrect; hind pair adpressed, long, the tips extending nearly to the base of antennae; front pair moderately long, directed forward; eyes large, black. Antennae very long, moderately slender, indistinctly pilose, testaceous, the terminal segment mostly black; segment I rather stout, moderately long, about three times as long as II; II slender, short; III very long, slender, straight, nearly three times as long as IV; IV moderately long, slightly thickened. Rostrum extending to intermediate coxae, the laminae more widely separated and convex within on metasternum. Body beneath brown. Legs moderately slender, testaceous. Bucculae broad, closed in front. Orifice present.

Pronotum moderately convex, pitted, yellowish brown, tricarinate, each carina composed of one row of tiny areolae; median carina more elevated on collar; lateral carinae almost parallel; paranota narrow, uniseriate, the margin finely serrate, calli distinct, brown. Elytra yellowish brown, a transverse band in front of middle fuscous, the nervures of sutural area more or less infusate; costal area moderately broad, mostly uniseriate, in the widest part irregularly biseriate; subcostal area finely reticulated, mostly triseriate, quadriseriate in widest part; discoidal area narrow, extending to middle of elytra, widest behind middle, there four areolae deep. Wings longer than abdomen.

Length, 2.90 mm; width, 1.00 mm.

Type (male), allotype (female), and 11 paratypes, Pucallpa, Peru, September 5, 1944. Similar to *T. oliveirai* Drake and Hambleton and *T. saueri* Drake and Hambleton and separated from them by the higher carinae, longer cephalic spines, and more distinctly serrate margins of elytra.

Tingis gamboana, n. sp.

Differs from *T. abundans*, n. sp., by the biseriate costal area and narrower paranota. Pronotum brownish, becoming lighter posteriorly, finely pitted, tricarinate, moderately, transversely convex; lateral carinae low, dis-

tinct, nonareolated, median carina more raised, indistinctly reticulated; collar distinct, areolated; paranota very narrow, slightly wider in front. Head reddish fuscous, with five testaceous spines; median spine very short; front pair longer, directed forward, their tips touching; hind pair much longer, adpressed, extending a little beyond anterior margins of eyes. Antennae testaceous, indistinctly pilose, moderately long; segment I moderately thick, short, about twice as long as II; II slenderer, very short; III straight, about two and one-half times as long as IV; IV moderately long, mostly black.

Elytra testaceous, with a moderately broad, transverse, fuscous band near base; costal area rather broad, regularly biseriata; subcostal area wide, mostly quadriseriate; discoidal area reaching middle of elytra, widest a little before apex, there four areolae deep; sutural area with a spot (veinlet) near base and another before apex fuscous. Legs testaceous, the tips of tarsi dark. Rostrum extending a little beyond mesosternum. Wings almost as long as elytra. Body beneath black, shiny.

Length, 2.90 mm; width, 1.10 mm.

Type (female) and allotype (male), Gamboa, Canal Zone, Panama, on elm, November 16, 1944. The more strongly convex pronotum, much narrower paranota, and the distinct, transverse band of elytra separate this species from *T. saueri* Drake and Hambleton and *T. oliveirai* Drake and Hambleton. The lateral carinae are also lower and the margins of elytra and paranota indistinctly serrate.

Amblystira fuscitarsis Champion

Guatemala City, Guatemala, November 23, 1944, 85 specimens, from *Derris elliptica*. Known also from Panama, Colombia, Cuba, Haiti, and Brazil.

Amblystira pallipes Stål

Tingo María, Peru, September 7, 1944, 1 specimen, taken sweeping vegetation. Specimens are also at hand from Brazil, Colombia, and Venezuela.

Sphaerocysta nosella, n. sp.

Small, testaceous, the cysts dark fuscous, the pronotum dark ferruginous. Pronotum moderately convex, finely pitted, tricarinate; carinae distinct, low, the lateral pair parallel, the median terminating behind in a small sub-

conal cyst. Hood moderately large, narrowed anteriorly, wider than high, its greatest width and length about equal, some of the areolae subhyaline, paranota moderately wide, uniseriate, the areolae hyaline.

Elytra widest at base, thence moderately narrowed posteriorly. The outer margin broadly rounded; costal area wide, biseriata, the areolae clear, large, not arranged in very regular rows; sutural area with moderately large, clear areolae; cyst moderately large, inflated, very dark. Body beneath brown. Legs testaceous, rather slender, the tarsi dark. Rostrum extending on metasternum. Antennae testaceous, the terminal segment mostly brownish black; segment I moderately swollen, nearly twice as long as II, the latter short; III long, slender, indistinctly pilose, three times as long as IV, the latter thickened apically.

Length, 2.10 mm; width, 1.00 mm.

Type (male), allotype (female), and 9 paratypes, Vinces, Ecuador, October 14, 1944. It resembles *S. inflata* Drake but is much smaller with narrower and uniseriate paranota, blackish cysts, and slenderer legs and antennae. This is the smallest member of the genus, and the nervures are much more delicate.

Phaeochila, n. gen.

Pronotum moderately convex, narrowed anteriorly, clothed with fine, long hairs, pitted, tricarinate; collar distinct, raised at middle so as to form a small hood, there slightly projecting in front; paranota narrow, uniseriate; head smooth, with spines absent or greatly atrophied. Bucculae short, reticulated, contiguous in front. Rostral channel wide; rostrum moderately long. Orifice present. Hypocostal ridge uniseriate. Antennae rather long, moderately stout, pilose; segment I rather short, stouter and longer than II; III longest; IV slightly thicker than III, moderately long. Legs moderately long. Elytra divided in the usual divisions, with a distinct, inflated area a little behind middle of nervure separating discoidal and subcostal areas, indistinctly clothed with fine, very short hairs; discoidal area not reaching middle of elytra.

Type of genus, *Phaeochila hirta* (Monte) = *Amblystira hirta* Monte.

This genus is allied to the genus *Acanthochila* Stål and may be separated from it by the tricarinate pronotum, absence of spines on

the margins of paranota and elytra. Separated from *Amblystira* Stål by the hood and tumid elevation of elytra; from *Sphaerocysta* Stål by the lack of pronotal cysts and shorter lateral carinae.

***Phaeochila hirta* (Monte)**

Amblystira hirta Monte, Arq. Inst. Biol. 2: 284, fig. 5. 1940.

Pucallpa, Peru, 7 specimens, September 5, 1944. This is the first record of this interesting species in Peru.

***Leptocysta sexnebulosa* Stål**

Villavicencio, Colombia, 1 female, November 3, 1944.

***Acanthocheila dira*, n. sp.**

Similar to *A. armigera* Stål in size and general appearance. Head black, with a long, median, erect, testaceous spine; hind pair of spines long, testaceous, adpressed; extending beyond eyes; segment I brown, thick, narrowed at base, three times as long as II, II short, brownish, slender; III long, testaceous, slightly bent, three times as long as IV; IV moderately thickened, blackish, testaceous at base. Legs rather slender, pale stramineous, moderately hairy, the tips of tarsi dark. Rostrum brownish, dark at tip, reaching hind margin of mesosternum.

Body beneath black, shiny; abdomen in female wide, broadly expanded, wings a little longer than abdomen. Hemelytra much more sharply expanded near base than in *A. armigera*, testaceous, considerably embrowned at base; costal area mostly biseriate, with brownish band near base; discoidal area short, mostly four areolae deep; subcostal area broad, closely reticulated within opposite discoidal area. Pronotum unicarinate, transversely convex, pitted, brown; paranota very narrow, uniseriate, the outer margin armed with much longer spines than in *A. armigera*, the second, third and fourth spines sharply reflexed. Apex of hind triangular projection truncate.

Length, 3.25 mm; width, 1.75 mm.

Type (female), El Porvenir, Guatemala, July 9, 1944. Separated from *A. armigera* Stål by the very long, erect, median spine of head, very long marginal spines of paranota and the more sharply widened basal portion of elytra.

***Acanthocheila armigera* Stål**

Many specimens, the commonest member of

the genus; Tingo María, Peru, September 14, 1944, and Machala, Ecuador, September 27, 1944; Villavicencio, Colombia, November 3, 1944; El Porvenir, Guatemala, July 9, 1944.

***Leptopharsa dapsilis*, n. sp.**

Elongate, rather broad, testaceous, the head and pronotum (except hind process) black. Head short, the spines greatly reduced; median and anterior pair represented by small tubercles; hind pair very slender, adpressed, testaceous. Antennae long, brown-fuscous, distinctly hairy; segment I moderately long, moderately thick, not quite three times as long as II; II short, slenderer; III straight, very slender, clothed with moderately long hairs, slightly more than three times as long as IV; IV moderately long, clothed with longer hairs, slightly thickened, black. Legs long, slender, dark brown; rostrum yellowish brown, dark at apex, extending a little beyond end of sulcus; rostral channel very wide, the laminae low. Bucculae testaceous, closed in front.

Pronotum moderately convex, pitted, tricarinate; median carina testaceous foliaceous, uniseriate, distinctly higher than lateral, the areolae moderately large; lateral carinae testaceous, rather short, terminating anteriorly at middle of disc, subparallel, uniseriate, the areolae small. Hood subglobose, moderately large, testaceous, slightly projecting in front. Paranota testaceous, moderately large, moderately reflexed, the outer margin rounded, mostly biseriate, the areolae moderately large. Elytra moderately broad, testaceous; costal area broad, biseriate along basal portion, triseriate in widest part, the areolae large and hyaline; subcostal area narrow, mostly triseriate, the areolae small; discoidal area small, not reaching middle of elytra, considerably embrowned, narrowed at base and apex, widest behind middle, there four areolae deep; sutural area closely reticulated at base, there considerably embrowned. Wings extending a little beyond apex of abdomen.

Length, 3.95 mm; width, 1.55 mm.

Type (male), allotype (female), and 86 paratypes, from *Olmediella betschleriana* (Goepf.), Guatemala City, Guatemala, July 9, 1944. The shorter lateral carinae separate this species from all other members of the genus.

***Leptopharsa deca*, n. sp.**

Differs from *L. usingeri* Drake in the biseri-

ate paranota, low carinae, differently formed hood, and fuscous apical portion of elytra. Antennae moderately long, slender, testaceous; segment I strongly incrassate, brownish, short, twice as long as II; II slender, slightly thicker than III, testaceous; III slenderest, about three times as long as IV; IV mostly brownish black, slightly thickened. Bucculae broad, meeting in front, testaceous, becoming brownish above. Rostrum extending beyond middle of mesosternum. Rostral laminae strongly foliaceous on mesosternum, narrowed posteriorly, the ends meeting behind; laminae lower on metasternum, cordate. Legs slender, testaceous, the tarsi darker. Head with moderately long, testaceous spines.

Hood rather large, a little longer in female than male, covering most of head, inflated, highest (crest) in front of center, slightly longer than high, higher than broad, the nervures embrowned. Paranota testaceous, biseriate, the areolae rather large, hyaline. Pronotum moderately convex, brown; carinae distinct, uniseriate, the areolae small, the lateral carinae slightly divaricating anteriorly. Elytra moderately broad, slightly constricted beyond middle, widest before apex, the tips separated in repose; costal area broad, mostly triseriate, quadriseriate in widest part, testaceous, the areolae large, clear; subcostal area finely areolated, brown, five areolae deep; discoidal area brown, not quite reaching middle of elytra; widest beyond middle, there five areolae deep, with a black-fuscous mark near middle of outer boundary; sutural area mostly clouded with fuscous, some of the apical areolae partly hyaline.

Length, 3.10 mm; width, 1.40 mm.

Type (male), allotype (female), and 3 paratypes, Pichilingue, Ecuador, October 1-2, 1944. The hood is much smaller, the first antennal segment much shorter and thicker, and the carinae much lower than in *L. praestantis* Drake. The meeting of the tips of the mesosternal laminae closes the rostral channel, but in a much different way structurally than in the genus *Gargaphia* Stål.

Leptopharsa ovantis, n. sp.

Differs from *L. furculata* (Champion) in having biseriate paranota, black-fuscous first antennal segment and slightly smaller hood. Color marking very similar to *L. furculata*. Antennae

rather long, indistinctly pilose; segment I moderately long, moderately incrassate; three times as long as II; II short, slenderer, testaceous; III long, straight, testaceous, slightly more than twice as long as IV; IV rather long, mostly black, beset with long hairs. Legs slender, testaceous, other characters very similar to *L. furculata*.

Length, 3.75 mm; width, 1.75 mm.

Type (male), allotype (female), and 3 paratypes, Tingo María, Peru, September 7, 1944.

Leptopharsa angustata (Champion)

Barcena, Guatemala, many specimens, November 28, 1944.

Leptopharsa tenuis (Champion)

Barcena, Guatemala, many specimens, on *Ichthyomethia grandifolia* (Donn. Smith), November 28, 1944.

Leptopharsa laureata, n. sp.

Small, moderately elongate; body beneath brown to black. Rostrum long, extending to end of sulcus, testaceous, black at tip; rostral laminae testaceous, concave within on metasternum. Antennae rather long, slender, indistinctly pilose; segment I black-fuscous, moderately thick, about three times as long as II; II short, testaceous, slightly enlarged; III long, slender, testaceous, about two and one-half times as long as IV; IV mostly dark fuscous, moderately long. Legs long, slender, testaceous. Eyes black. Head black, with five moderately long spines; hind pair testaceous, adpressed; median spine brownish to black, turned downward.

Pronotum black, moderately, transversely convex, pitted; carinae testaceous, low indistinctly areolate, the lateral carinae slightly concave within on disc; paranota testaceous, biseriate, the outer margin rounded; hood small, inflated, slightly projecting in front. Elytra moderately broad, indistinctly serrate along outer margins; costal area testaceous, moderately wide, mostly biseriate, triseriate in widest part, the areolae clear and moderately large; subcostal area narrow, biseriate, the veins black-fuscous; discoidal area extending to middle of elytra, narrow, narrowed at base and apex, four areolae deep in widest part, the veins fuscous-black; sutural area more widely reticulated; the veins infuscate.

Length, 2.20 mm; width, 1.00 mm.

Type (male), allotype (female) and 11 paratypes, Pucallpa, Peru, September 5, 1944. Allied to *L. bondari* Drake and Poor from Brazil but separated from it by the longer rostrum, triseriate costal area in widest part and lower carinae, especially median. The lateral margins of the elytra also are more rounded.

Leptopharsa jubaris, n. sp.

Small, ovate, testaceous, the pronotum brownish. Head black, with rather short, testaceous spines; hind pair adpressed, the three frontal spines shorter, directed forward, sometimes adpressed. Rostrum brownish, extending to metasternum; metasternal laminae cordate. Orifice distinct. Bucculae infuscate, closed in front. Antennae moderately long, slender, testaceous; segment I short, moderately thick, twice as long as II; III very slender, straight, indistinctly pilose, nearly three times as long as IV; IV brownish, moderately thickened, beset with longer hairs.

Pronotum moderately transversely convex, finely pitted, truncate in front, tricarinate; median carina uniseriate, the areolae tiny; lateral carinae less elevated, subparallel; collar raised, with tiny hood; paranota moderately broad, reflexed, testaceous, biseriate in front, uniseriate behind, the outer margin rounded; triangular process testaceous, reticulated. Elytra with tips only slightly separated in repose; costal area rather broad, testaceous, mostly biseriate, triseriate in widest part, the areolae rather small; subcostal area narrow, brownish, mostly biseriate; discoidal area grayish brown to brown, extending to middle of elytra, widest beyond middle, there five areolae deep; sutural area more widely reticulated, the nervures considerably embrowned; wings fumose, longer than abdomen. Body beneath black.

Length, 2.70 mm; width, 1.00 mm.

Type (male), allotype (female), and 12 paratypes, Pichilingue, Ecuador, October 1-2, 1944; 1 paratype, El Topo, Ecuador, October 5, 1944. Separated from *L. distantis* Drake in having the costal area triseriate in widest part, narrower subcostal area, and discoidal area narrower apically.

Leptopharsa lauta, n. sp.

Small, whitish testaceous, the veins in sutural area considerably embrowned, the areolae hyaline, iridescent. Head black, with five long, slender, testaceous spines. Rostrum

brown, black at tip, extending beyond middle of mesosternum; laminae low, whitish, testaceous, uniseriate. Antennae moderately long, slender; indistinctly pilose; segment I brownish black, moderately long, moderately thick, nearly three times as long as II; II slender, short, brown; III long, very slender, about three times as long as IV; IV moderately thickened, brown, clothed with pale hairs. Body beneath black. Legs very slender, long, yellowish brown, the tarsi dark.

Pronotum moderately convex, black, finely pitted, tricarinate; median carina foliaceous, distinctly more elevated than lateral, composed of one row of high, rectangular areolae; lateral carinae low, each composed of one row of elongate areolae. Hood rather small, slightly compressed laterally, subequal in height and length. Paranota moderately broad, distinctly reflexed, biseriate, the areolae moderately large, the outer margin rounded, beset with moderately long, bristly hairs. Triangular process of pronotum reticulated, whitish testaceous. Elytra distinctly constricted slightly beyond middle, the outer margins armed with rather long, very slender spines; costal area wide, biseriate along basal half, triseriate in widest part, the areolae rather large and not arranged in definite rows; subcostal area moderately wide, biseriate; discoidal area rather short, not reaching middle of elytra, the boundary raised, highest a little behind middle.

Length, 2.30 mm; width, 0.90 mm.

Type (male), allotype (female), and 11 paratypes, Vices, Ecuador, October 14, 1944. This species may be separated from *L. setigera* (Champion) by its smaller size, narrower paranota and smaller hood. *L. fimbriata* (Champion) is a distinctly larger species.

Leptopharsa luxa, n. sp.

Very small, testaceous, the pronotum, collar, carinae, and discoidal, subcostal, and sutural areas brown; areolae hyaline, the areolae in sutural area infuscate with clear centers. Antennae moderately long, indistinctly pilose, testaceous; segment I brown, short, about twice as long as II; III long, about three times as long as IV; IV mostly black, slightly thickened. Head black; posterior spines testaceous, rather long, adpressed, median spine brown, shorter, directed obliquely upward. Rostrum brownish, black at tip, not quite reaching base of meso-

sternum; laminae widely separated, low, testaceous. Legs slender, testaceous, the tarsi dark. Abdomen beneath black, the sternum brown.

Pronotum moderately convex, finely pitted, tricarinate; carinae sharply raised, uniseriate, the areolae tiny; lateral carinae slightly diverging anteriorly; collar raised anteriorly, finely areolate; paranota long, narrow, subangularly projecting in front, testaceous, biseriata, the areolae moderately large, hyaline. Elytra widening at base, widest a little beyond base, thence moderately narrowing posteriorly, slightly constricted beyond middle, the apices not overlapping in repose; costal area wide, mostly biseriata, triseriate in widest part, the areolae moderately large; subcostal area narrow, mostly biseriata; discoidal area very narrow, pointed at base and apex, biseriata or triseriate in widest part, not reaching middle of elytra, the areolae small, with whitish opaque centers; areolae of sutural area larger.

Length, 2.00 mm; width, 0.80 mm.

Type (male), allotype (female), and 1 paratype, Vices, Ecuador, October 14, 1944.

This tiny species is not easily confused with other species of the genus. The size, color pattern of elytra, and rectangular paranota are distinguished characters. In general aspect it resembles somewhat members of the genus *Atheas* Champion.

Leptopharsa divisa (Champion)

Barcena, Guatemala, 1 specimen, November 22, 1944.

Phymacysta tumida (Champion)

Tingo María, Peru, 4 specimens, September 10, 1944; Machala, Ecuador, 2 specimens, September 27, 1944. These specimens tend to be a little larger than most specimens before us from Venezuela, Panama, Trinidad, Haiti, and Brazil. *L. malpighae* Drake from Cuba belongs to the genus *Phymacysta* Monte. *Leptopharsa cubana* Drake is a synonym of *L. malpighae* Drake.

Leptodictya bambusae Drake

Many examples taken on sugarcane, Machala, Ecuador, September 27, 1944; on *Bambusa vulgaris*, San Andrés, El Salvador, July 21, 1944, and El Porvenir, Guatemala, July 9, 1944. This species ranges from Texas to Peru and is recorded from the West Indies. It is also recorded as a pest of maize.

Leptodictya fraterna Monte

San José, Costa Rica, many specimens from bamboo, August 20, 1944. This species is closely related to *L. cretata* Champion from which it differs largely in having the basal antennal segment slightly longer and fuscous-black. The second segment is concolorous with the first.

Leptodictya ecuadoris, n. sp.

Small, black-fuscous, the antennae, paranota and legs testaceous, the pronotum, discoidal and subcostal areas brownish, the areolae of costal area within, the centers of marginal areolae, some of the areolae of subcostal area and paranota hyaline. Head with five, testaceous, very long, slender, prorect spines. The median spine longest. Antennae long, slender, indistinctly pilose; segment I short, a little stouter and about twice as long as II; III slightly more than three times as long as IV; IV slightly thickened, light fuscous, moderately long. Legs long, slender, testaceous. Rostrum extending on metasternum, yellowish brown; laminae testaceous, not widely separated.

Pronotum moderately, transversely convex, distinctly pitted, sharply tricarinate; carinae testaceous, each uniseriate, the lateral carinae parallel; hood sharply raised, highest in front, low behind, compressed laterally; paranota biseriata above (overlapping part). Elytra broad, the tips separated in repose; outer margins broadly rounded, widest before apex; costal area wide, six areolae deep in widest part, the areolae large; subcostal area uniseriate; discoidal area elongate, extending to middle of elytra, narrowed at base and apex, widest near middle, there four areolae deep. Male tending to be a little smaller than female.

Length, 3.00 mm; width, 1.75 mm–1.95 mm.

Type (male), allotype (female), and 35 paratypes, from bamboo, Vices, Ecuador, October 14, 1944.

Differs from *L. nota* Drake in having elytra much broader at base and of different color pattern. In *L. nota* the elytra are gradually widened posteriorly.

Leptodictya laidis, n. sp.

Head dark reddish brown, convex above, with five long, slender spines; anterior pair shortest, fuscous, not quite reaching apex of first antennal segments; median spine longest, fuscous, pale at base, extending beyond middle of second segment; hind pair long, a little

shorter than median, fuscous, pale at base, directed forward, slightly divaricating anteriorly. Antennae rather long, indistinctly pilose; segment I moderately swollen, dark fuscous, about two and one-half times as long as II; II slightly slender, short, dark fuscous; III yellowish brown, long, slightly more than twice as long as IV; IV blackish, long, slightly thickened, slightly bowed. Bucculae wide, blackish; rostral channel deep, rather wide, the laminae brown; rostrum brown, black at tip, reaching middle of mesosternum. Abdomen brown beneath. Legs yellowish brown, the tarsi dark.

Pronotum slightly, transversely convex, coarsely pitted, tricarinate, each carina finely uniseriate, the lateral pair parallel, the median slightly more raised in front. Hood low, slightly produced in front, the areolae small, whitish, the nervelets infusate. Paranota white-testaceous, uniseriate behind, biseriate in front. Elytra broad, roundly expanded at base, the tips separated; costal area very wide, rather widely reticulated, five or six areolae deep in widest part, the nervures mostly dark fuscous, the areolae at base and a transverse band (three areolae deep) clear, the rest of the areolae largely infusate; discoidal area elongate, extending beyond middle of elytra, narrowed at base and apex, the areolae clear, the veins dark fuscous; sutural area, widely reticulated, the nervures dark fuscous, some of the areolae clear or not entirely infusate. Wings smoky, nearly as long as abdomen.

Length, 3.80 mm; width, 2.10 mm–2.25 mm.

Type (male), allotype (female), and 40 paratypes, from bamboo, Villavicencio, Colombia, November 3, 1944. This species is very pretty, and the color of the elytra is difficult to describe because of the variation in fuscous color of areolae.

Leptodictya nigrosis, n. sp.

Broad, closely reticulated, dark fuscous, with a large pale spot in costal area opposite apex of discoidal area, the areolae of paranota clear. Head black, with five rather long, brownish spines. Legs slender, brownish. Rostrum brownish, reaching beyond mesosternum. Antennae moderately long, indistinctly pilose; segment I short, dark fuscous, nearly twice as long as II; II slender, yellowish brown; III long, yellowish brown, three times as long as IV; IV black-

ish, slightly enlarged, clothed with long hair.

Pronotum moderately, transversely convex, closely pitted; carinae foliaceous, each uniseriate, the areolae small; lateral carinae slightly convex within in front, the median a little more elevated. Hood rather small, scarcely produced in front, tentiform, the areolae whitish opaque. Paranota moderately broad, the reflexed part biseriate. Elytra very broad, rounded at base; costal area very wide, with four or five transverse nervures slightly enlarged, the areolae small, whitish or fuscous opaque; subcostal area narrow, biseriate; discoidal area large, extending beyond middle of elytra, narrowed at base and apex, widest near middle, the areolae confused in arrangement and several deep in widest part; sutural area more widely reticulated, the areolae subopaque. Body beneath blackish.

Length, 4.15 mm; width, 2.10 mm.

Type (male), allotype (female), and 4 paratypes, from bamboo, Tingo María, Peru, September 7, 1944. This species is longer than the other dark-colored members of the genus, and more closely reticulated.

Leptodictya parilis, n. sp.

Moderately large, grayish to dark-fuscous, the areolae hyaline. Head black, with five moderately long, brown spines. The median and front pair erect. Eyes large, dark reddish. Rostrum extending beyond middle of metasternum. Antennae rather long, indistinctly pilose; segment I black-fuscous, moderately long, thicker and three times as long as II; II brown, short; III very long, brown; IV dark.

Pronotum moderately, longly transversely convex, grayish fuscous, tricarinate, the carinae indistinctly areolate, moderately large, inflated, slightly produced in front. Elytra moderately wide, becoming slightly wider posteriorly. The outer margin distinctly, finely serrate; costal area moderately broad, rather closely reticulated, with three, transverse, slightly thickened nervures, the areolae not arranged in definite rows, ranging from five deep at base to seven or eight in widest part; subcostal area narrow, biseriate; discoidal area elongate, narrowed at base and apex, widest near middle, there five areolae deep; sutural area large, becoming more widely reticulated posteriorly. Wings not reaching apex of abdomen, smoky.

Length, 3.40 mm; width, 1.60 mm.

Type (male), from bamboo, San Andrés, El

Salvador, July 21–26, 1944. This species with dark fuscous nervures and clear areolae is probably most closely akin to *L. olyrae* Drake but readily separated by the longer hood, longer first antennal segment, lower carinae, more longly convex pronotum and differently shaped elytra. In addition to other characters, the hyaline areolae separate it from other dark-colored species with more or less clouded areolae.

Leptodictya lucida, n. sp.

Large, stramineous, the paranota pale, the areolae hyaline, iridescent. Head brown, with five long spines; anterior pair shortest, directed forward, extending a little beyond middle of first antennal segments; median spine very long, extending to tip of first antennal segments; hind pair long, divaricating toward tips. Antennae indistinctly pilose, moderately long; segment I moderately long, thick, about two and one-half times as long as II; III long, slender, slightly more than twice as long as IV, the latter dark fuscous. Legs slender, yellowish brown, the tarsi dark. Rostrum reaching a little beyond mesosternum. Body beneath brown.

Pronotum moderately, transversely convex, tricarinate, the carinae indistinctly areolate, the median slightly more elevated in front; lateral carinae slightly divaricating anteriorly; paranota moderately wide, wider in front, mostly biseriate. Elytra very broad, divaricating posteriorly, the tips separated in repose, the outer margin broadly rounded; costal area very wide, with three, transverse, slightly thickened nervures, the areolae not arranged in definite rows, about eight or nine deep in widest part, those within along discoidal area smaller; subcostal area very narrow, uniseriate; discoidal area long, narrow, widest near middle, there five areolae deep.

Length, 3.55 mm; width, 2.20 mm.

Type (male), allotype (female), and 1 paratype; from bamboo, Tingo María, Peru, September 7, 1944. Separated from *L. sodalatis* Drake by the shortly pilose antennae, much narrower paranota, differently shaped elytra with smooth lateral margins.

Leptodictya decoris, n. sp.

Moderately large, broad, rather widely reticulated. Head black, convex above, with five brownish spines; front pair extending a little

beyond middle of first antennal segments; median and hind pair extremely long, directed obliquely forward. Antennae testaceous, indistinctly pilose, the last segment dark fuscous; segment I rather short, thicker and about twice as long as IV; IV slightly thickened, long, clothed with longer hairs. Rostrum brownish, dark at tip, extending between intermediate coxae. Legs slender, testaceous, the tarsi dark. Body beneath brown to black. Orifice distinct.

Pronotum moderately, transversely convex, closely pitted, polished, the paranota, carinae, collar and hood whitish, the hind triangular process of pronotum testaceous to whitish; paranota moderately wide, with single row of transverse, rectangular areolae; hood small, narrow, slightly projecting anteriorly; carinae low, indistinctly areolate, the median slightly higher in front; lateral carinae faintly diverging anteriorly. Elytra broad, broadly rounded at base white-testaceous, the outer nervure thickened and infusate, the areolae clear, the veinlets along the outer margins sometimes partly infusate; costal area broad, with six to seven irregular rows of areolae in greater part; subcostal area narrow, biseriate; discoidal area elongate, narrowed at base and apex, widest near middle, there four areolae deep; sutural area widely areolated.

Length, 3.85 mm; width, 2.00 mm.

Type (male), allotype (female), and 14 paratypes, from bamboo, Tingo María, Peru, September 7, 1944. This very pretty species may be separated from congeners by color, low carinae and broad elytra. The tips of the elytra are moderately separated in repose, the outer margins finely serrate and the areolae somewhat iridescent.

Ulocysta, n. gen.

Distinctly lacy, the areolae large and hyaline. Hood very large, covering base of head and extending posteriorly so as to conceal most of hind process of pronotum, united beneath on triangular process with median carina; median carina foliaceous, arising behind disc and extending a little beyond hind margin of hood. Lateral carinae absent. Paranota moderately wide, foliaceous, moderately reflexed. Head short, armed with five spines. Antennae long, slender; segment I very long, stoutest; II very short; III longest, slenderest; IV very long, half the length of III, slightly thickened. Buc-

culae rather short, reticulated, closed in front. Rostral channel wide; laminal low; rostrum long. Legs slender, rather long. Orifice atrophied. Elytra long, divaricating posteriorly, apices widely separated in repose; discoidal area short, not extending to apex of abdomen. Marginal nervure of elytra and median longitudinal nervure of hood thickened.

Genotype, *Ulocysta praestabilis*, n. sp.

This genus may be separated from *Ambycysta* Drake and Hurd by the much larger hood, unicarinate pronotum, long first and fourth antennal segments and short discoidal area of elytra; and from *Megalocysta* Champion by the long first and fourth antennal segments, raised posterior portion of hood, slender legs and antennae, thinner nervures of reticulations and short discoidal area. The genus *Alloithucha* Drake has much shorter antennal segments and differently formed hood and triangular process of pronotum.

***Ulocysta praestabilis*, n. sp.**

Moderately large, the areolae hyaline, the elytra strongly divaricating posteriorly, yellowish brown, some of the veins darker, head black, the spines testaceous, the median distinctly longer than others. Rostrum brown, extending beyond middle of mesosternum. Body beneath brown. Legs long, very slender, brownish. Antennae long, very slender; segment I brown, about twice as long as the width of head across eyes; II short, brown, slenderer; III yellowish brown, indistinctly pilose, less than twice the length of IV; IV very long, slightly thicker, clothed with longer hairs, distinctly longer than I, becoming black apically. Hood extremely large, somewhat pyriform, twice as long as high, inflated, widely reticulated, testaceous, the areolae hyaline, the median nervure straight, thick and dark; median carina clouded behind, there two areolae high; two very elongate areolae beneath hood. Paranota biseriate, the areolae moderately large, elytra strongly divaricating posteriorly, with marginal and some of the oblique nervures somewhat darkened, the areolae large and hyaline; discoidal area scarcely extending beyond apex of hind pronotal process, mostly biseriate, widest a little in front of apex; costal area mostly biseriate, triseriate in widest part; subcostal area narrower, mostly biseriate; sutural area widely reticulated.

Length, 3.20 mm; width (behind hood), 1.90 mm.

Type (female) and allotype (male), San José, Colombia, November 11, 1944.

***Dicysta hollandi* Drake**

Pucallpa, Peru, 17 specimens, September 5, 1944.

***Dicysta vitrea* Champion**

Tingo María, Peru, 10 specimens, September 10, 1944.

***Gargaphia nigrinervis* Stål**

Tingo María, Peru, 19 specimens, September 10, 1944; San José, and Villavicencio, Colombia, many specimens, November 1944.

***Gargaphia seorsa*, n. sp.**

Very similar in size, color marking and appearance to *G. serjaniae* Drake and Hambleton and differs in having longer spines on head, the elytra broadly ovate, and the paranota expanded laterally at anterior end, there two or three areolae deep. Rostrum reaching beyond middle of mesosternum. Head with five very long, slender spines, the median spines reaching beyond apex of first antennal segment, the front pair a little shorter, the hind pair very long. Paranota rather broad, mostly triseriate, the outer margin rounded, the front margin obliquely expanded. Hood moderately large, slightly smaller than in *G. serjaniae*. Body beneath brown. Elytra broad, the outer margin broadly rounded, widest in front of middle; costal area broad, mostly triseriate, quadriseriate in widest part. Margins of paranota and elytra finely serrate. Other characters very similar to *G. serjaniae*.

Length, 4.25 mm; width, 1.65 mm.

Type (male), allotype (female) and 18 paratypes, Aguaytia, Peru, Sept. 6, 1944, and 13 paratypes, Pucallpa, Peru, Sept. 6, 1944. The paranota are roundly expanded and without distinct anterior margin; the elytra are widest a little before the apices in repose.

***Gargaphia neivai* Drake and Poor**

Pichilingue, Ecuador, 6 specimens, October 15, 1944. Known heretofore from Paraguay.

***Gargaphia opima* Drake**

Numerous examples, Aguaytia and Tingo María, Peru, taken on *Canavalia ensiformis*; 1

specimen, Villavicencio, Colombia, November 3, 1944. *Gargaphia inca* Monte, Rev. Brazil. Biol. 3 (1): 105, fig. 1, 1943, is suppressed as a synonym of *M. opima*.

Gargaphia paula Drake and Hambleton

Tingo María, Peru, 18 specimens, September 10, 1944. Known heretofore only from the Canal Zone, Panama.

Gargaphia acmonis, n. sp.

Moderately elongate, distinctly widening posteriorly. Head black, with five long, testaceous spines, the anterior pair shortest. Antennae long, indistinctly pilose; segment I moderately long, rather stout, fuscous-black, three times as long as II; II short, testaceous, slenderer; III slender, testaceous, approximately three times as long as IV; IV largely fuscous-black, moderately long, clothed with longer hairs. Rostrum extending to middle of mesosternum. Bucculae closed in front. Orifice prominent. Legs long, slender, testaceous, the tarsi dark.

Elytra gradually widening posteriorly, the tips somewhat separated in repose; costal area moderately wide, gradually widening posteriorly, testaceous, uniseriate along basal half, biseriate in widest part, the areolae clear and moderately large. Other characters of elytra and pronotum very similar to *G. lunulata* (Mayr).

Length, 3.30 mm; width, 1.30 mm.

Type (male), allotype (female), and 10 paratypes, Tingo María, Peru, September 10, 1944; also 5 paratypes, San José, Colombia, November 11, 1944; and 1 paratype, Río Rimac, Peru. The shape of the elytra and uniseriate basal half of costal area separate this species from *G. lunulata* (Mayr), its nearest relative.

Corythaica costata Gibson

Many examples, Salinas and Machala, Ecuador, September and October 1944; several specimens, Villavicencio, Colombia, November 13, 1944.

Corythaica cyanthiicollis (Costa)

Tingis cyanthiicollis Costa, Ann. Mus. Zool. Nap. 1864 (2): 146, fig. 2.

Leptopharsa passiflorae Berg, Hemip. Arg. Add. Emend. 1884: 102.

Corythaica cyanthiicollis Drake and Poor, Inst. Mus. Univ. La Plata 3: 108. 1938.

Corythaica passiflorae Monte, Papeis Avulsos São Paulo 1942: 110.

San José, Colombia, many specimens, November 11, 1944. This species is one of the commonest and most widely distributed tingitids in Neotropical America and one of the most confused species in the literature. Monte, *loc. cit.*, has greatly added to this confusion, and most of his remarks are inept because he has failed to study carefully Costa's figure of *Tingis cyanthiicollis*.

Corythucha gossypii (Fabricius)

Barcena, Guatemala, many examples, November 22, 1944; also many specimens from San Andrés, El Salvador, July 21-26, 1944; Pichilingue, Ecuador, October 1-2, 1944; and Managua, Nicaragua, August 1944. This insect is a pest of the cotton plant, eggplant, and pigeon pea.

Corythucha decens Stål

Los Cerritos, Guatemala; many specimens, July 5, 1944.

Corythucha nocentis Drake and Hambleton

Machala, Ecuador, many specimens, September 27, 1944.

Corythucha deceptiva Drake

Santa María de Jesús, Guatemala, many specimens, November 14, 1944.

Corythucha seguyi Drake

Tingo María, Peru, 5 specimens, September 7, 1944.

Corythucha sarta, n. sp.

Moderately large, testaceous, some spots on paranota, hood, tumid elevation of elytra and a transverse band near base of costal area brown to black-fuscous, the areolae hyaline. Hood moderately large, constricted near the middle, narrowed in front, inflated behind, the hind portion about as high as wide. Median carina foliaceous, slightly higher in front, mostly uniseriate; lateral carinae not very high, gradually elevated anteriorly, terminating some distance from hood. Paranota moderately large, the outer margin and some of the veinlets beset with short spines. Elytra slightly constricted beyond middle, with rather large tumid elevation; costal area wide, with three rows of rather large areolae, the areolae in transverse band much smaller (except outer

row) and more numerous. Antennae testaceous, moderately long, beset with very long, stiff hairs, the fourth segment embrowned. Bucculae, rostral laminae and body beneath black. Rostrum brown, extending to middle of mesosternum. Legs brownish, the tibiae testaceous.

Length, 3.85 mm; width, 2.25 mm.

Type (male), allotype (female), and 40 para-

types, from an unidentified ornamental tree, Lake Atitlán, Guatemala, July 9, 1944. Related to *C. decepta* Drake and *C. setosa* Champion but with larger tumid area of elytra and with hood fully twice as large. The hood is much smaller than in *C. globigera* Breddin or *C. unifasciata* Champion. In general aspect *C. sarta* resembles more closely *unifasciata*.

PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

PHILOSOPHICAL SOCIETY

1236TH MEETING

The 1236th meeting was held in the Cosmos Club Auditorium, October 14, 1944, President STIMSON presiding.

Program: GEORGE A. GAMOW, George Washington University: *Weizsacker's planetary theory*.—It was pointed out that, although this theory had been published in Germany, the speaker's copy was one of few that had probably been received in this country because of the war. Although the published theory was incomplete in details and possibly open to certain criticisms, the speaker considered it worthy of consideration and perhaps of further development. (*Secretary's abstract.*)

Mr. A. J. SCHNEIDEROV presented an informal communication on his planetary theory.

1237TH MEETING

The 1237th meeting was held in the Cosmos Club Auditorium, October 28, 1944, President STIMSON presiding.

Program: J. BARKLEY ROSSER, Cornell University: *Many-valued logics*.—The "Law of the Excluded Middle" to the effect that every exact statement is necessarily either true or false is not an absolute law of nature which cannot be transgressed. On the contrary, it is merely a habit of thought of the human race. There exist orderly systems of reasoning which flatly deny this principle. Such a system was discussed with some illustrative examples. Although this system is violently contradictory to accepted tenets of logic, it is quite consistent in itself, and could presumably be used as a basis for scientific thought. It appears to contain a mathematics of a most unfamiliar sort, which nevertheless contains certain of the standard features of the familiar mathematics.

In a certain sense, one can say that this new mathematics lacks the "sharp edges" of the old, and this suggests the possibility that, when more is known of the new mathematics, it may be a useful instrument for the treatment of quantum mechanics, which seems to be a sort of physics without "sharp edges." (*Author's abstract.*)

J. ALLEN HYNEK, Perkins Observatory, Ohio Wesleyan University: *The "science" of astrology*.—From an astronomer's viewpoint, the relatively widespread recognition of popular acceptance of belief in astrological precepts is disturbing and out of keeping with the scientific enlightenment characteristic of the present day. Recognizing the possible need for an objective demonstration of the fallacy of certain concepts held by a large part of the astrologically inclined, the writer has in his paper presented a statistical analysis of several thousand cases taken from the "American Men of Science." An analysis of the birth date frequency and the "aspects" of the planet Mercury to all other planets demonstrates by standard statistical techniques that the probability of favorable zodiacal positions of Mercury (astrologically denotes superior mental abilities) in the horoscopes of "Men of Science" is that given by the ordinary laws of chance. It is hoped that such an objective test might be useful as a classroom example. (*Author's abstract.*)

1238TH MEETING

The 1238th meeting was held in the Cosmos Club Auditorium, November 11, 1944, President STIMSON presiding.

Program: H. A. MARMER, U. S. Coast and Geodetic Survey: *Mean sea level*.—The level of the sea at any point is subject to the disturbing influence of various agencies, but